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Materials scientist honored as ASME Fellow

by Fred Coleman, Materials and Manufacturing Directorate

Dr. Ajit K. Roy

WRIGHT-PATTERSON AIR FORCE BASE, Ohio — Dr. Ajit K. Roy, of the Air Force Research Laboratory's Materials and Manufacturing Directorate, was recently elected a fellow in the American Society of Mechanical Engineering (ASME).

The award is in recognition for more than 20 years of groundbreaking research in advanced analytical modeling and test method development for organic matrix composite materials. The award will be presented at ASME's annual meeting in New Orleans, La., in November.

A researcher in the directorate's structural materials branch, Roy is responsible for conducting and managing basic research activities in mechanics of composite materials, particularly in the area of novel materials forms and analytical tools for failure analysis composite materials. He is responsible for managing a technology portfolio of approximately $5 million annually to develop advanced composite materials technology in organic matrix composites. The focus of his portfolio has been on developing pervasive materials systems and materials forms to address future Air Force needs. He is also responsible for generating requirements, implementing investment strategy, and transitioning technology to end users as well as defining vision for short-term and long-term research and development goals.

Roy has been serving as the Department of Defense focal point for carbon foam technology. Carbon foam is a tailorable, ultra-lightweight and high temperature multifunctional material. For this emerging material, Roy has been instrumental in generating requirements and facilitating technical interchange through the annual Carbon Foam Workshop, as well as developing new characterization tools.

Under the direction and research contributions of Roy, an analytical/numerical tool (software) to perform stress analysis of three-dimensionally reinforced composites was developed. This software provided the first comprehensive fracture mechanics methodology for failure analysis of textile composites by explicitly satisfying the complex and curved interface surface stress and displacement continuity of intricate textile reinforcements.

Roy initiated and led an integrated analytical and experimental program on predicting three-dimensional thermo-elastic behavior of thick laminated composites and carbon-carbon composites. He developed unique test methods for characterizing matrix-dominated properties, a key to enhancing performance of carbon-carbon composites. Roy was also instrumental in generating and analyzing the fatigue performance data of carbon-carbon composites that did not exist.

Overall, Roy has made significant contribution, in a wide variety of composite technologies that have advanced the state of the art through peer recognition and publications that have become industry standards. **@**